

REMARKS

The Futawatari '289 Reference

US 6,357,289 (Futawatari) discloses a system for controlling a plurality of engaging elements e using an actuator d. The system shown in Fig. 1 and described in column 2 line 16 to column 3 line 21 has a primary input means (elements a, b and c) and a secondary fail-safe input means (elements g, j, i, and k) for controlling actuator d. Thus, actuator d is supplied with 2 inputs.

Fig 1 shows an actuator d that is checked by comparing its directly measured on/off state h and an estimated on/off state b. This comparison is done in the “automatic transmission control system”. There is no mention in Futawatari '289 of using 2 microprocessors (or anything similar) – the closest to this is the possible implication of two means to control the actuator d by two arrows going into this “box” in Fig. 1. Reading col. 2, line 16 to col. 3 line 21 it appears that this could be taken as a description of Fig 1. However, Futawatari '289 does not mention a microprocessor. It does not mention two separate devices driving the load. Applicants claim two devices to control a load, both able to detect a fault and turn the load off. The '289 patent might be argued to have two devices c and k for controlling the load; but only one of these k is able to detect a fault. This means that in the cited art a single failure in the “automatic transmission control system” b may mean that the safety system is disabled with no way to detect this situation.

Engagement-disengagement command means b outputs a command to actuator d based on the parameters determined by the sensor (column 2, lines 19-27). The fail-safe input means includes a comparison means which outputs a command to the actuator via fail-safe mode engagement means k only when it has been determined that failure has occurred (column 2 lines 47 to 56). In other words, the actuator has a primary input (elements a, b and c) which is overridden by a secondary input (elements g, j, i and k) only when element j of the secondary input means detects a fault. Primary input (elements a, b and c), which cannot detect a fault in the control of the load, does not itself have a fail-safe; nor does it conduct any validation of the output it sends.

Thus, Futawatari does not disclose two microprocessors (or inputs) arranged so that when either microprocessor detects a fault, the load is switched off. Only the secondary input means of Futawatari is able to detect a fault. Furthermore, Futawatari discloses a secondary fail-safe input which sets the position of the actuators when an error is detected. The previously amended claim 1 of the present invention claims a system “... arranged so that when either microprocessor

detects a fault in the control of the load, the load is switched off". System claim 1 and corresponding method claim 8 are not taught by Futawatari owing to this feature

New claims 17 and 18 add the further novel feature that the second microprocessor also monitors the first microprocessor so that detection of a fault in the first microprocessor will switch out the load or halt operation of the first microprocessor.

The Matsuda Reference

Matsuda teaches the concept of inter-checking between microprocessors in order to detect errors in the output of the microprocessors rather than monitoring loads, as recognized by the Examiner. Consequently, there is no teaching of monitoring the load and therefore nothing to motivate the reader to combine the teaching of Matsuda with Futawatari.

The Combined Teachings

Even if skilled personnel did combine the teachings of Matsuda and Futawatari, they would not arrive at the claimed invention. In particular, Matsuda teaches inter-checking of the signals before they reach the load. Thus, an attempt to combine Matsuda with Futawatari, would not provide at a system "...arranged so that when either microprocessor detects a fault in the control of the load, the load is switched off."

The Invention Claimed

The claimed invention provides a system in which both input-providing element 16 and 18 monitor the load with a view to detecting errors. This is not obvious in light of Futawatari where any failure in the secondary input means will leave the system unprotected. The present invention thus solves a problem which is not even identified in the applied references.

Respectfully submitted,

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